



UNITED STATES PATENT AND TRADEMARK OFFICE

RP

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,871	03/16/2001	Benjamin N. Eldridge	P70-US	7472

27520 7590 10/17/2003

FORMFACTOR, INC.
LEGAL DEPARTMENT
2140 RESEARCH DRIVE
LIVERMORE, CA 94550

EXAMINER

GILMAN, ALEXANDER

ART UNIT	PAPER NUMBER
----------	--------------

2833

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

RR

Office Action Summary	Application No. 09/810,871	Applicant(s) ELDRIDGE ET AL.	
	Examiner Alexander Gilman	Art Unit 2833	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-58 and 60-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-58, 60-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 58, 60-74, and 76-78 are rejected under 35 U.S.C. 102(b) as being anticipated by Eldridge et al (US Pat. No. 5,974,662).

With regard to claims 58 and 76-78, Eldridge et al (US Pat. No. 5,974,662 disclose an assembly comprising:

a contactor (502);

an interposer substrate (r.n. 506 and col. 27, lines 64-67) having first and second opposite sides with a first set of resilient contact elements (514) on the first side and the second set of resilient contact elements (524).

a base (not shown) supporting the semiconductor device (508) comprising a wafer with a plurality of unsingulated dice (col. 1, lines 32-38) .

With regard to claims 60-74, Eldridge et al (US Pat. No. 5,974,662 disclose all of the limitations as respectively applied to claims 37,39,41-49, 51-54 below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to

Art Unit: 2833

a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 36, 39-57 and 75 are rejected under 35 U.S.C. 102(b) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) in view of Brown.

With regard to claims 36, 43, 48 Eldridge et al (US Pat. No. 5,974,662) disclose an assembly comprising:

a contactor (502);

an interposer substrate (504) having first and second opposite sides with a first set of resilient contact elements on the first side and the second set of resilient contact elements

a base (not shown) supporting the semiconductor device (508).

Eldridge et al (US Pat. No. 5,974,662) do not disclose:

a flexible substrate of the contactor.

Brown (US 4,820,976) discloses

a flexible substrate (28) of the contactor.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Eldridge et al contactor with a flexible substrate, as taught by Brown, to assure sufficient and balanced electrical contact (Eldridge, col. 2, lines 6-9).

With regard to claims 39, 40, 61, Eldridge et al disclose the contact elements comprise a cantiliver beam

With regard to claims 41, 62, Eldridge et al disclose the resilient contact structures are offset in position from said second set of resilient contacts structures (Fig. 4, col. 28, lines 24-34).

With regard to claims 43-47, 65-68, Eldridge et al disclose the electronic devices disposed on the substrate (col. 28, lines 44-46).

With regard to claims 51-57, 75, Eldridge et al disclose that contactor comprising integrated circuits for testing semiconductor device including a wafer or plurality of singulated dices.

Art Unit: 2833

2. Claims 37, 38, 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) and Eldridge et al (US Pat. No. 6,184,053)

Eldridge et al (US Pat. No. 5,974,662) disclose all of the limitations except for the resilient contact structures formed lithographically .

Eldridge et al (US Pat. No. 6,184,053) disclose the resilient contact structures, comprise a cantiliver beams and are formed lithographically (col. 3, lines 6-11).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Eldridge et al (US Pat. No. 5,974,662) interposer with the resilient contact structures formed lithographically as taught by Eldridge et al (US Pat. No. 6,184,053), to precisely dispose the contacts

3. Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) and further in view of Khandros et al.

Eldridge et al (US Pat. No. 5,974,662) discloses all of the limitations except for the overtravel stops.

Khandros et al (US Pat. No. 6,064,213) disclose the overtravel stops (114).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Loranger et al - Eldridge et al (US Pat. No. 5,974,662) with the overtravel stops as taught by Khandros et al (US Pat. No. 6,064,213), to control the travel length of the resilient contacts during the test.

4. Claims 42 and 63 rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al (US Pat. No. 5,974,662) and further in view of Brozowski et al.

Loranger et al - Eldridge et al (US Pat. No. 5,974,662) discloses all of the limitations except for the flexible substrate.

Brozowski et al (Electronic Packaging & Interconnection Handbook, McGraw-Hill, 1997, Ch. 8) disclose (p. 8-5) the flexible substrate.

Art Unit: 2833

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Loranger et al - Eldridge et al (US Pat. No. 5,974,662) with the flexible substrate, as taught by Brozowski et al, to improve alignment of the mating contacts..

Response to Arguments

Applicant's arguments filed 10/02/2003 have been fully considered but they are not persuasive.

With regard to claim 58, the typographical error was corrected (the interposer should be equated with element 506 while element 504 is eliminated (col. 27, lines 64-67). Said clarification removes the Applicants' argument regarding alleged impossibility of the prior art (Eldridge et al) to connect the contactor (502) and the wafer (508) with the resilient contacts (524, 514) of the interposer (506).

With regard to claim 36, Applicants argue that Brown's (the secondary reference) flexible PCB (contactor) will affect the mechanism of planarizing the tips of 524 in the primary reference (Eldridge et al).

However, the mechanism of tips adjustment in Eldridge et al does not depend from rigidity of the contactor but relies on elements 536, 538, 546, 532. It is not required in Eldridge to make 502 rigid for leveling 524. Moreover, the requirement that 530 and 534 should be rigid assumes the that 502 can be flexible.

In response to Applicants' argument that there is no motivation to modify Eldridge et al contactor by making it flexible, as taught by Brown, Examiner respectfully submits that such a modification is suggested by Eldridge et al (col. 2, lines 5-10). and Brown (col. 1, lines 41-43).

The flexibility of the contactor, along with the resilience of the contacts (514) contribute to assuring sufficient and balanced electrical contact (Eldridge, col. 2, lines 6-9).

As for structural features of Brown contactor, it is submitted that utilization of the Brown's flexible contactor seems to be proper since the structure of the flexible contactor is not claimed or described in the specification.

Art Unit: 2833

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

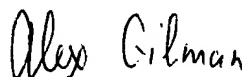
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Gilman whose telephone number is (703) 305-0847. The examiner can normally be reached on Monday-Friday, 10:30 a.m. - 8:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on (703) 308-2319. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

10/15/2003



**ALEXANDER GILMAN
PRIMARY EXAMINER**